

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 12-29 are again rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The applicant's written description fails to teach "unamplified" output of the cavity-dumped femtosecond laser as recited in the amended claims.

In the response filed on November 16, 2010, the applicant's representative amended the independent claims 12 and 22 in order to overcome the 112 first paragraph rejection of the claim in the Office Action of August 18, 2010. The applicant's representative further states in page 5 of the Remarks/Argument section of November 16, 2010 that the "Independent claims 12 and 22 have now been amended to remove the recitation of the output being unamplified." The examiner further notes that the amendment to the independent claims 12 and 22 partially removes the term "unamplified" from the claims (see claim 12 line 3 and claim 22 line 4 of the amended

claims). However, claims 12 still recites the limitation "unamplified output" in line 8; and claim 22 recited the term "without amplification" in line 6.

Note: the applicant's written description teaches that the prior art femtosecond lasers used for material matching employ optical amplifiers to boost the output energy of the ablation/cutting pulses up to some millijoules. The applicant further teaches that such amplified pulses are limited to "some 10s of KHz" and the need to overcome this disadvantage (see Pars. 0006 - 0008 of the published form of the instant application).

In paragraphs 0016 - 0020 of the published application, the applicant describes the laser device according to the claimed invention. The applicant further states that the claimed laser is capable to provide "micro joule pulse energies at adjustable repetition rates from zero up to some MHz," and overcomes the frequency limitation of the prior art lasers, which results from the use of Pockels cell. However, the applicant's specification fails to clearly teach that the output laser pulses are not amplified as recited in the claims. Moreover, Par. 0068 of the published application clearly teaches that at least some of the laser pulses are amplified and have lower repetition rate.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 12-14, 16-19, 20, 22, 24, 30, and 32 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Borrelli et al. Pub. No. US 2003/0099452 A1.

With respect to claims 12, 16-19, 22, 26, 27, 30 and 32, Borrelli et al. disclose a femtosecond laser system and method of used for forming a waveguide structure in a verity of glass substrates, or for producing widened waveguides by directing ultra-short laser pulses to the substrate, the laser system comprising: a cavity-dumped femtosecond laser configured to generate laser radiation having a pulse duration of less than 150 femtoseconds (see Pars. 0010 and claim 1), a pulse energy of in the range between 0.5 to 0.8 micro-joules (see Pars. 0035 and 0059); and a holding device configured to fix the glass substrate in a defined position relative the laser pulses as claimed. Borrelli et al. further teach that the use of cavity-dumped laser providing pulse duration of less than 150 femtoseconds and energy in the range of 1 uJ to 1 mJ is known in the art (see Par. 0005). The court held that “[W]hen, as by a recitation of ranges or otherwise, a claim covers several compositions, the claim is anticipated’ if one of them is in the prior art.” Titanium Metals Corp. v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). Similarly, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties.

With respect to claims 13, 26, and 27, the recited claim language is directed to intended use. Intended use claim language in a system claim is generally given a limited patentable weight.

With respect to claims 14 and 24, the laser system further comprises a number of optical components such as lenses and beam deflection optics for guiding the laser pulse (see Figs. 1 and 10).

With respect to claim 16, Borrelli et al. further teach that the “glass substrate **20** is mounted on an XYZ coordinate motion table **22**.” See Fig. 1 and Par. 0037.

With respect to claim 19, Borrelli et al. further teach that the laser pulses have repetition rate in the KHz range as claimed (see Pars. 0005, 0035, and 0059)

With respect to claim 21, Borrelli et al. teach that “[t]he variables affecting the change in refractive index, including translation rate, spot focus size, repetition rate, pulse energy, wavelength, and focusing, can also be varied along the length of the waveguide 40 to compensate for varying amounts of overlap between the tracks 42 or to modify the waveguiding properties of the waveguide 40.” See Par. 0045. They further teach that “[i]t will be apparent to those skilled in the art that various modifications and variations can be made to the present invention without departing from the spirit and scope of the invention.” See Par. 0061.

Claim 15 is rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Borrelli et al. ('452).

With respect to claim 15, Borrelli et al., described above, do not teach the use of computer controlled optical system (beam apparatus) for guiding the laser pulses as claimed. However, they teach the use of a computer controlled translation system (drives 24, 26, and 28) for translating the glass substrate relative the incident laser pulses (see Fig. 1 and Par. 0037). The examiner further notes that the technique for fixing the target and using a programmable optical system for guiding a laser beam to a desired region of the target is well known in the art. Hence, at the time of the applicant's invention, it would have been obvious to one of ordinary skill in the art to modify Borrelli et al. and fix the position of the glass substrate relative to the incident beam, and to use a programmable optical system as an equivalent alternative guiding/ translating means in order to direct the laser pulses to the desired region as claimed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AHMED FARAH whose telephone number is (571)272-4765. The examiner can normally be reached on Mon-Fr. between 9:30 AM 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yao Sam can be reached on (571) 272-1224. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Ahmed M Farah/
Primary Examiner, Art Unit 3769

September 18, 2012.